Ontario fish and wildlife Review

Vol. 17, No. 1, 1978

Wherein we hawk an interesting lesson on geography, meteorology and the migration patterns of raptors. Robert Wenting and Marshall Field tell where, why, etc.

Jack Armstrong of the Ministry of Transportation and Communications, a former colleague and Review contributor, remembers us with some true words on values.

Carsten Jorgensen finds a world of flavor in carp, and Bill Creighton recommends living brushpiles.

Daryl Smith adds a note to natural history.

Our thanks to Erika Thimm for our cover record of the rainbow fishing on the Beaver River near Thornbury. And to Gerry Merchant for his fine shot of a loon in Esker Lakes Park.

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The goal of the Ministry of Natural Resources is to provide opportunities for outdoor recreation and resource development for the continuous social and economic benefit of the people of Ontario, and to administer, protect and conserve public lands and waters.

Ontario Ministry of Natural Resources

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5635

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EDITORIAL

A problem with salmon

The salmon fishery in Lake Ontario is a boon in the lake but a bane in the river.

The salmon program began rather quietly as an experiment in 1969 when the Ontario government first stocked coho in the Credit River and Bronte Creek. Coho plantings have been repeated almost yearly since then. Chinook salmon were planted in Bronte Creek in 1974 and rainbow trout have been put in the Credit River since 1976. Lake trout yearlings have been stocked off Clarkson since 1976.

As the sea lamprey in Lake Ontario came under control, more salmon returned to their "parent" streams. By 1975 a new lake fishery had developed in the months of August and September. Each succeeding year the salmon fever has escalated.

Despite the limited access to Lake Ontario and the high levels of contaminants, anglers scrambled to get out into the lake after the trophy-size salmon.

By early October most of the salmon have entered the rivers. The anglers forsake the lake and river mouths to follow the fish upstream and that's when all the problems begin—littering, trespassing, vandalism and illegal fishing.

In the river the salmon are an ugly copy of their silvery lake phase. They turn black, their flesh becomes soft, their scales tear off easily, the males' upper jaws become deformed and they stop feeding. Residents of British Columbia, long accustomed to salmon runs, turn their backs on the fish once they are in the river, referring to them as "dirty old spawners."

To the people living along the Credit River the salmon run was new and exciting but they were soon upset by the swarm of anglers who highhandedly walked across everybody's property. The indignant landowners demanded protection and some even suggested that the stocking of salmon be discontinued.

Since 1974, conservation officers and Peel regional police have worked overtime to cope with the problems spawned by the presence of the large fish in the usually quiet and shallow waters of the Credit River and Bronte Creek.

In the fall of 1975 conservation officers laid 394 charges of illegal fishing during the salmon run in the Credit River.

In 1976 the Credit River from Brittania Road in Streetsville to the Queen Elizabeth Way was closed to fishing. The many anglers who ignored courtesy and respect have only themselves to blame for this closure.

In the long term the Ministry of Natural Resources is attempting to rehabilitate the lake with lake trout and the tributary streams with rainbow trout. In the short term the stocking of salmon will continue until the rainbows and lake trout are in sufficient numbers to sustain a worthwhile fishery. The phasing out of salmon is not likely to happen for some years.

In the interim the Pacific salmon will provide local anglers with an exciting lake fishery. It is the stream fishery that continues to cause all the headaches.

We are optimistic enough to believe that we can have a civilized fishery in the metropolitan area and we will continue to strive for this. How well we succeed or fail here could determine the future of the fishing programs close to urban areas elsewhere in Ontario. Success will require the self-discipline of anglers.

INTROSPECT

A personal opinion
not necessarily endorsed by
the Ministry of Natural Resources

Silly signs

by A. A. Wainio

Extension Biologist, Fisheries Branch

Bird sanctuary signs are unnecessary and have no legal status.

Under The Game and Fish Act of Ontario and the Migratory Bird Convention Act of Canada, nearly all wild birds are protected and the many non-game birds are protected the year round. The province is their sanctuary.

So why put up signs?

The birds recognize no boundaries and fly from area to area. The territorial claims of some birds extend beyond the posted boundaries.

Perhaps people think the birds are endangered, but the birds they want to protect are far from being endangered. They are common species—some as common as pigeons.

I get the impression that some people believe all they have to do to protect "the pretty wild birds" is nail up sanctuary signs and put out bird feed. Never mind the bulldozer tearing down the neighbouring woodlot.

I'm sure the landowners are trying to intimidate people. They don't want to keep birds in; they want to keep people out. They should realize that those who would damage the habitat or destroy the birds will not be intimidated by signs.

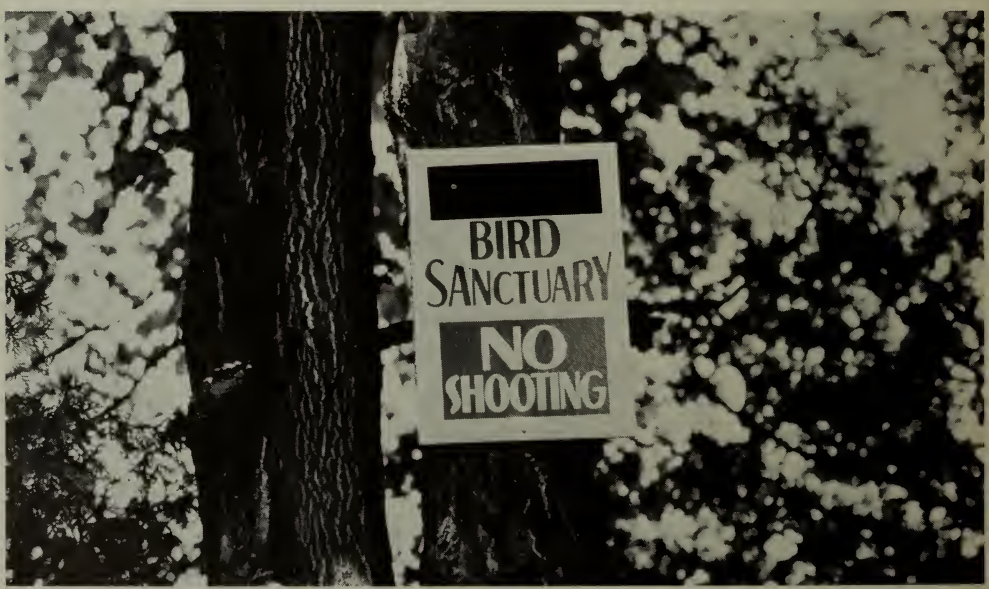
There's another aspect of this sanctuary problem that I find annoying. Have you ever noticed how many of these signs are labelled Bird Sanctuary? Why do they think only of birds? Do they hate squirrels and rabbits? Do they abhor skunks?

If you wish to conserve birds, then learn to conserve trees, shrubs, weeds, water and soil. Accomplish this and many animals will benefit. They are all linked together in an organic web which is held together by constructive work—not signs.

To me a wildlife sanctuary is an unposted plot of land with a mixture of food, shrubs, water, trees, both deciduous and coniferous, and open spaces. Birds, mammals, herptiles and insects will be attracted to this interspersion of habitats. Some will breed and then leave and others will stay.

Signs don't foster a healthy wildlife population. Good habitat does. Cover, water and food are the "signs" that wildlife recognize and need.

Signs are apt to identify the property of a person who preaches wildlife conservation but doesn't know how to practise it.



Biologist Gerry McKeating with peregrine falcon.

Hawk spectacular

Report and photos by R. J. Wenting
Biologist, Aylmer District

AT Hawk Cliff nature stages a marvellous fly-past of hawks and other raptors each fall. Rising elevators of air carry these birds of prey high in the sky and people thrill to see them glide close to the ground and then boil into the blue.

The massed flights of raptors are spectacular when atmospheric conditions are right, and every fall thousands of people visit the cliff, just east of Port Stanley. It is perhaps the best place in North America to see the annual migration.

The viewing season lasts from early September to late December. Songbirds are seen in abundance, and monarch butterflies seem almost to clutter the cliff-side fields at times. It is the raptor flights, however, that give Hawk Cliff its international reputation.

The inability of most raptor species to cross large bodies of water results in the massed flights that can be seen at Hawk Cliff. When migrating birds from Quebec and Ontario encounter the Great Lakes, they are funneled into southwestern Ontario along the north shorelines of Lake Ontario and Lake Erie.

Raptors migrating from Quebec and Ontario may cross into the United States at Kingston, or somewhere along the Niagara River, but the majority tend to follow the shoreline of the lower Great Lakes and cross at Windsor.

The concentrations seen at Hawk Cliff are the result of birds trying to migrate south from the end of the Long Point Peninsula. Unable to do so, they fly northwest to Hawk Cliff. West of Hawk Cliff, the flyway widens and, except for accipiter flights at Point Pelee, hawks can seldom be seen again in such large concentrations on their southern migrations.

Much of the Lake Erie shoreline west of the Long Point Peninsula is characterized by steep bluffs, often 50 to 70 metres high, which deflect surface winds from the lake. Many hawks are adapted for soaring and use these updrafts for their migration. Light, northwesterly winds, common in autumn, aid in this flight.

The uneven heating of the earth in late summer produces bubbles of warm air called ''thermals'' which rise much like smoke

rings, and soaring hawks use these ascending thermals. When the thermals dissipate in the upper atmosphere, often beyond the view of the naked eye, the hawks glide diagonally downward in search of another thermal. In this way, hawks can migrate long distances with relatively little expenditure of energy.

There are three common types of raptors—falcons, accipiters and buteos. Falcons have long pointed wings, long tails, and a characteristic rowing flight. Accipiters have short stubby wings, long tails, and a characteristic flight of three to five flaps followed by a glide. Buteos have short wide wings, short wide tails, and a characteristic soaring flight.

At Hawk Cliff, the broad-winged hawk (a buteo) is the most common migrant although often missed because of its high-altitude thermal flight. A record 70,000 were seen on a single day in 1961 and an estimated 18,000 were recorded on September 14, 1977. Among the three species of accipiters—goshawk, Cooper's hawk and sharp-shinned hawk—the last is the most common. Among the three falcons—peregrine, merlin and kestrel—the kestrel is most common.

Habitat differences at Hawk Cliff tend to separate migrating raptors. Generally, falcons follow the shoreline, preferring the open fields of this area, their usual hunting habitat. Accipiters move in greatest numbers approximately one-quarter mile (1.2 km) inland, along the edge of woodlots and wooded ravines, their hunting habitat where they prey on small birds. Buteos and marsh hawks (harriers) show the most variation in their flight path.

Raptors tend to have extended migration periods, reflecting their relatively asocial behaviour. The breeding ranges for all species are extensive and their movement southward, correspondingly, is prolonged.

While migrations continue from early September to late December, some movement actually begins in July with the emigration of young-of-the-year kestrels from local areas. While the initial movement of juvenile birds may be assumed to be a response to pressure from adult birds and give the appearance of migration, it is not known if juvenile birds move north before they move south. In August, young sharp-shinned hawks may join kestrels in migration.

In September, when thermal activity is good, the massed flights of broad-winged hawks begin. Large numbers of sharp-shinned hawks, kestrels and marsh hawks, and smaller numbers of Cooper's hawks, ospreys and merlins can also be seen. Occasionally peregrines, goshawks and bald and golden eagles may be seen.

During October, the greatest variety of raptor species are present but their numbers are smaller. Sharp-shinned hawks still dominate and more red-tailed hawks (buteos) are seen. Turkey vultures, red-shouldered hawks and rough-legged hawks may also be observed. November and December flights pass through quickly and may include most species.

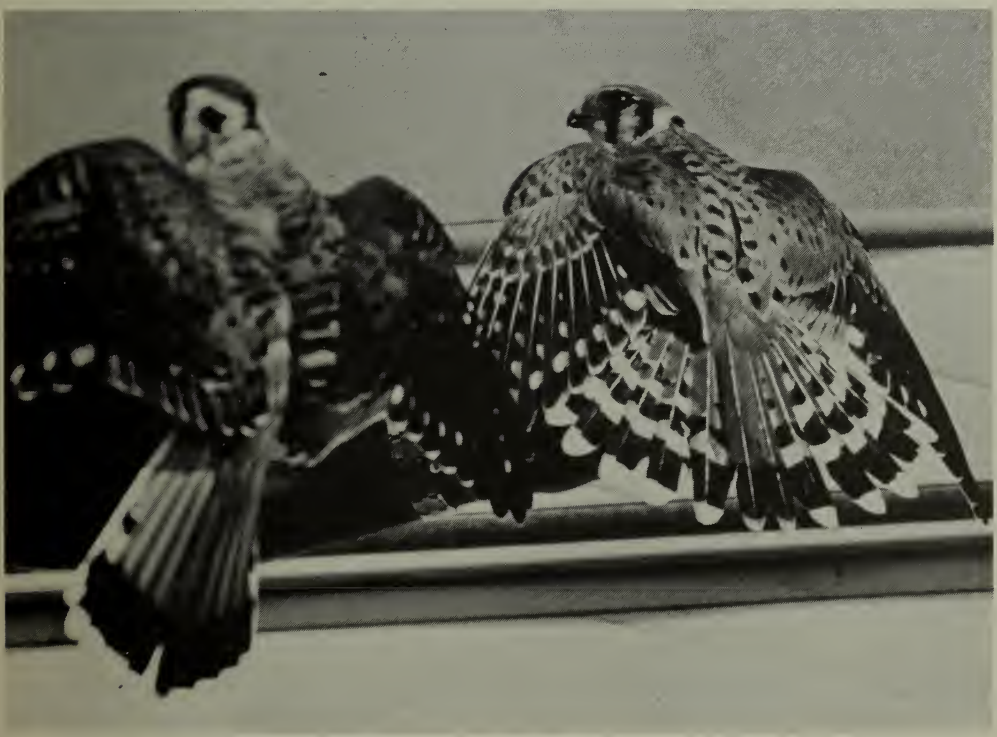
In general, the long-distance migrants tend to move first. Broad-winged hawks and ospreys are in this category, wintering in Central and South America. Some of the former, however, only travel as far as the western United States. Peregrine, merlin, turkey vulture, sharp-shinned hawk, Cooper's hawk, red-shouldered hawk, rough-legged hawk, bald eagle and marsh hawk are all medium-distance migrants. Goshawks, red-tailed hawks, golden eagles and kestrels are short-distance migrants.

A variety of factors determine when the migration of individuals of any species will occur. The speed of the migrant, weather conditions, the age of the bird and the available food are all important. How far a bird will go in its migration also is variable. Furthermore, migration is not a certainty as some birds may overwinter when conditions permit.

It is thought that these migrations may be an environmental response, triggered by a low-pressure system over northern Ontario and Quebec and coupled with the passage of a cold front across southern Ontario. Northwesterly winds usually follow and the flights begin. Large flights occur when winds are light and thermal activity is pronounced, as indicated by the presence of cumulus clouds. Spectacular flights occur when such conditions have been preceded by an extended period of inclement weather that has arrested all raptor movement.

Once migration has begun, the movement of birds is constant. Raptors will attempt flight in almost any light wind condition and even in light precipitation. Accipiter movement, in particular, tends to be almost con-

A broad-winged hawk is shown to visitors.



Two male kestrels attract attention.

Interpretation at Hawk Cliff Wildlife Agreement Area.

tinuous, no doubt a response to the movement of their prey, regardless of the weather.

The clearest way to interpret raptor migration is to consider it as a southward movement of a widely-spread mass of birds that, for one period of time in the autumn, may be concentrated at a location because of geographical and physical restrictions to the migration.

Since its "discovery" in 1931, Hawk Cliff has attracted visitors each year, and hawkwatching enthusiasts patiently visit and revisit the area in hopes of being present when "everything is just right" and "that" flight occurs.

In 1975 interested local people in Aylmer District enquired if a portion of Hawk Cliff could be set aside and protected for hawk watching. Finding the landowner receptive, the Ministry of Natural Resources was able to establish the Hawk Cliff Wildlife Agreement Area. It covers 33.6 hectares (83 acres) on the west side of the extension of Elgin County Road 22, 11 km south of St. Thomas. It runs to Lake Erie and contains open fields, wooded ravines, ridges and an abundance of wildlife food shrubs.

Little has been done to the property except to mow areas for viewing and parking and to plant a roadside hedge of multiflora rose to discourage trail-bike use.

For the past three years, on the third weekend in September, the Ministry has joined the Hawk Cliff Raptor Banding Station Committee and the St. Thomas Field Naturalists Club, to present a Hawk Cliff Viewing Weekend. About 1,500 people turn out each year to enjoy the raptor migrations. The sponsoring organizations provide interpretive displays, including live birds captured at the nearby banding stations.

The third week in September usually corresponds with the peak in raptor migration over Hawk Cliff but this is subject to weather conditions. Flights may be greatly reduced or virtually non-existent. Often the winds are of such a high velocity that flights are "pushed" inland, well beyond the viewing area of Hawk Cliff.

On September 17, 1977, the first day of the viewing weekend, the following raptors were seen:

1	broadwinged hawk
150	sharp-shinned hawks
15	kestrels
15	marsh hawks
1	Cooper's hawk
2	merlins
6	ospreys
1	peregrine
1	bald eagle.

Considering the unsettled weather conditions of the previous day and the morning of

A bander indicates relative size of sharp-shinned hawk.

Looking west at edge of Hawk Cliff.—Photo by W. A. Creighton.

that particular day, this was a "good flight" for the day. Three days earlier, conditions were ideal and the following species and numbers were recorded:

18,000	broad-winged hawks
1,800	sharp-shinned hawks
1,200	kestrels
92	marsh hawks
35	Cooper's hawks
15	red-tailed hawks
11	ospreys
4	peregrines
3	goshawks
2	bald eagles
1	merlin.

With the path of migration at Hawk Cliff at least one-half mile (0.8 km) wide, accurate counts are difficult and many birds are missed.

Bluejays pour through Hawk Cliff every day in late September. Their ribbon-like pattern of flight often breaks as they scatter to safety when a hawk appears to be in pursuit. Tufted titmice, a raven, and various species of warblers were all seen last year. In one hour in the morning of October 22, an estimated 500 eastern bluebirds passed directly over the main viewing area. Between 35 and 40 of these birds attempted to enter, en masse, a kestrel nesting box erected in a dead tree directly across the road from the viewing area.

It is disappointing to visit Hawk Cliff and not see raptors. However, regular visitors learn to recognize the signs of a good flight—heavy rain, followed by bright blue skies, warm temperatures, a few cumulus clouds and northwesterly winds. On such days the crowds will gather at Hawk Cliff and be rewarded.

With sharp-shinned hawks often passing within a few feet of the viewer, with ospreys often only 20 to 30 feet overhead, with kestrels hovering over a grasshopper only a short distance away, with the congregation of the apparently-fragile monarch butterflies, with a peregrine in "rowing" flight, and with the thermal flight of broadwings in a "boiling kettle" ascent, there is little wonder that most visitors to Hawk Cliff become regulars.

The Ausable River flows through Hungry Hollow.

Close up of a queen snake taken in Hungry Hollow, August, 1977.

The Queen of Hungry Hollow

Report and photos by R. H. Spurr
District Planner, Chatham District

THE queen snake, *Regina septemvittata,* is an agile tree climber and often rests on branches overhanging the water. It is also an excellent swimmer and diver and can lie submerged like a submarine for lengthy periods. It is considered scarce in southwestern Ontario but the point is in some doubt as, because of its striped appearance, it has often been mistaken for the eastern garter snake, *Thamnophis sirtalis sirtalis.*

One of the known habitats of the queen snake in southwestern Ontario is Hungry Hollow, 1.5 km (one mile) east of Arkona in the County of Middlesex. Hungry Hollow is the local name given to the area where the Ausable River cuts through the rock sediments of the Devonian Sea which covered most of Ontario with salt water 350 million years ago.

Here long ago lived creatures similar to those of the Pacific or Atlantic coral reefs today. There were corals, sponges, starfish, snails, clams, crabs, worms and animals such as crinoids (sea lilies, similar to sea anemones) and trilobites, black-shelled creatures with huge compound eyes, now long extinct.

As the ages passed, sedimentation gradually covered the sea floor and its plants and creatures. Minerals dissolved out of the sediments and crystallized around the plant and animal remains, preserving their forms in sharp detail.

Glacial activities exposed the fossil beds of Hungry Hollow and revealed a notable characteristic—the fossil remains are "free" and do not have to be hammered out of the rocks.

Here, among the remains of primitive life, we find the queen snake which scarcely lives

up to its majestic name. It is considerably more slender than most water snakes and reaches a length of only 76 cm (30 inches). It is a dark olive brown with a broad yellow stripe along each side and usually with three narrow black lines down the back. The scales on its body are dull and keeled.

The queen snake can usually be identified by its yellow belly with four brownish, dusky stripes. The two outer stripes are wider than the centre two and run along the edges of the yellow belly plates.

The queen is also known as the leather snake or willow snake—the latter because it is often seen where willows grow.

It frequents the margins of streams, especially those with a slow current and gravelly bottom. When disturbed, it will usually plunge into the water and take refuge beneath aquatic plants, remaining below the surface for some time.

When queen snakes are feeding, they have been observed to lie motionless on the bottom of shallow ponds, partly covered in ooze. When schools of small fish swim above, the snake reaches up and seizes its prey with a snapping, whip-like motion. The tiny fish is swallowed with a slight movement of the jaws, and the snake continues to feed in this manner until it is gorged.

Crayfish are the main food of the queen snake and amphibians are also taken. If taken captive, the queen snake is difficult to feed and usually dies of emaciation.

The young are live-born between July and early September. There may be from five to 18 in a litter but more than 12 is not common. The young have clearly defined belly stripes and measure from 19 to 23 cm (7½ to 9 inches) at birth.

Queen snakes congregate in the fall before hibernating on dry land. In Ohio, 125 were observed in a small area in a shallow, rocky creek and 24 were found under a single rock.

Hungry Hollow, a small rock exposure created by a glacier, provides a habitat for the queen snake among the fossil remains of its distant ancestors—the rare among the extinct.

A difficult capture. The queen moves swiftly and lashes about wildly.

Placing the first tiers of logs to make a crib brushpile.

Blood, sweat and tiers

Report and photos by W. A. Creighton
Wildlife Biologist, Southwestern Region

BRAIN and brawn must work together to transform mediocre wildlife habitat into good habitat; and if you bleed a little (those hawthorn needles are sharp) remember it's in a good cause. With good planning and hard work, any landowner or manager can manipulate food and cover to increase the production of wildlife.

The point was demonstrated in a nine-day workshop conducted by the Ministry of Natural Resources in the Hullett Wildlife Management Area last year. Biologists and resource technicians received practical on-the-ground experience for three days in March, May and September.

Fourteen wildlife habitat improvement practices (detailed below) were completed on the workshop property. Few shrubs or trees were planted as we relied almost entirely on the vegetation already growing on the property. We cut or released the native growth to improve wildlife habitat.

Some improvements were an immediate benefit to wildlife while others would not reach their full value for two or three years. As indicated below, some improvements are best completed at particular times.

The following nine improvement practices were completed in March.

1. Crib Brushpile

The crib brushpile, based on tiers of logs, provides shelter for cottontails and many other small animals.

A cribbing of logs, with alternate tiers at right angles, gives the brushpile a long life since the upper tiers continue to provide shelter as the lower layers rot into the ground. Branches, heaped on top, provide additional shelter.

To grow food and cover for the animals sheltered by the brushpile, clear areas around the crib to encourage a dense growth of small trees and herbaceous plants.

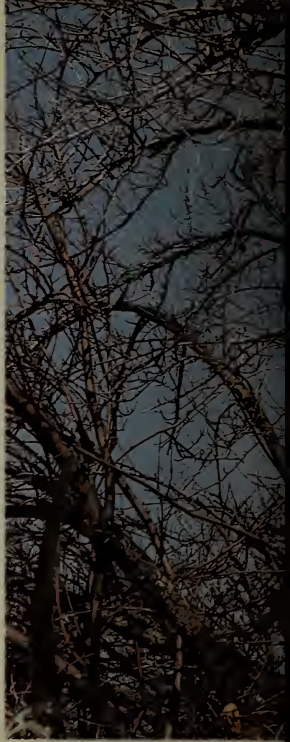
To encourage wildlife on your land, build four cribs per acre.

2. Living Brushpile

Living brushpiles provide winter cover and food close to the ground for cottontails, other small mammals, deer and birds.

The "living" shelter is based on young trees, cut part way through and bent toward a common centre. The "hinged" trees remain

A crib brushpile nears completion.



An apple tree is pruned he

Sumac is cut to increase wildlife food supply.

Trees are hinged to make

The forest edge is cut to make a shrubby border.

rushpile.

Trees are cut to release one side of a hedgerow.

alive for several years. Pole stands of maples and ashes are most suitable but birches and other hardwoods work quite well.

This cutting opens the forest canopy. Long grasses and briars grow up through the branches to create additional cover.

To encourage wildlife, build four living brushpiles per acre and place them near woodlot edges, fencerows, ravines and evergreen plantations.

3. Loose Brushpile

Branches from prunings and thinnings will benefit wildlife if piled along hedgerows or woodlot edges. Loose piles allow grasses and weeds to grow through, providing cover close to the ground for wildlife.

4. Apple Tree Release

Apple trees are valuable to wildlife because they provide buds, fruit and bark, but they need full exposure to sunlight.

Old apple trees can be rejuvenated by removing the surrounding tall vegetation for a distance of 30 feet (nine metres) and pruning heavily in March or April. Cut away all dead branches and from a third to a half of the living branches.

To stimulate apple tree growth, rake and apply one pound of nitrogen fertilizer or its equivalent beneath the trees. (More will cause leaf scald.)

5. Hedgerow Release

Hedgerows should provide cover close to the ground and be close to food—especially if they are used by wildlife as travel lanes and escape routes.

Cut trees along the existing hedge on only one side of the hedge—and hinge the trees whenever possible. Supplemental conifers and wildlife shrubs should be planted on the opposite side of the hedge.

Cut trees three inches (7.6 cm) in diameter or larger, but do not cut black cherry, eastern hop hornbeam, white birch, male aspen or mast-producing trees—nut trees such as oak, hickory, walnut and butternut.

Mow grass strips on both sides of the hedgerow and as close as possible without cutting the planted shrubs or the tops of fallen trees.

Fertilize the hedgerow lightly, twice each summer, with 100 pounds of 10-10-10 per 500 feet (153 metres).

Maintain the hedge by cutting all stems greater than three inches in diameter and leave the cuttings along the hedgerow.

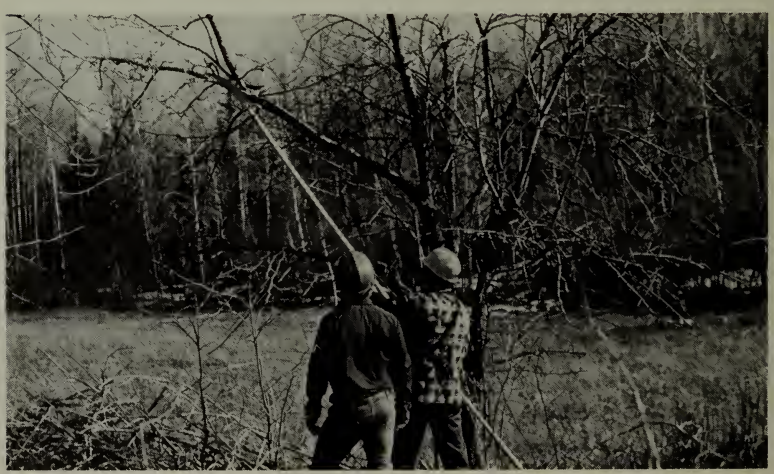
6. Sumac Stands Cutting

To provide food and cover for wildlife, cut over-mature stems of sumac in winter on an annual rotation basis. Plan to do this work where rabbits browse heavily or where mature stems are close to good rabbit cover. The new growth will provide an increased amount of fruit for wintering songbirds.

7. Woodlot Edge Cutting

To stimulate the growth of young trees and shrubs, cut back the forest edge 30 feet (nine metres) or more. Cut trees greater than three inches in diameter every few years.

The shrubby border between open fields and forest will give wildlife an abundance of food and cover close to the ground. You may



Apple trees lose all the dead limbs and up to half the living branches.

see deer and rabbit browse signs on new sprouts and an increased number of bird nests should be evident.

8. Conifer Half-Cutting

The topping of six- to eight-foot (about two metres) conifers (or cutting the tops part way through) causes the lower branches to grow outward and produce a denser evergreen. This heavier cover is important to the survival of wildlife in late fall and winter.

9. Hawthorn Management

Fields overgrown by hawthorn have few wildlife openings, little winter cover, and no ground cover at all. The hinging of hawthorn trees in various patterns provides cover close to the ground and creates the openings needed by wildlife.

The following five improvement practices were completed in May.

10. Woodlot Openings

Openings in large hardwood forests attract many wildlife species.

For good distribution of openings and cover, it is necessary to clear-cut areas of one-half to two acres (about one-quarter to one hectare) in a uniform pattern throughout the forest. A total of 10 acres should be cleared in every 100 acres of woodland. Openings of one-quarter acre or less are short-lived because tree crowns expand so rapidly.

A preferred pattern is an opening of one acre surrounded by half-acre clear-cuts. If cut in rotation (a few each year) and recut every 10 to 15 years (in rotation), these areas will maintain their maximum usefulness to wildlife.

A rectangular to irregular-shaped clear-cut is preferred to a square or a circle because it provides more edge. The distances between clear-cuts should be less than 300 yards (274 metres) to give a good interspersion of openings and cover.

Male trembling aspen, white birch, eastern hop hornbeam, and black cherry should be favored in all cutting operations. Be careful not to cut den trees or mast trees.

11. Girdling

When opening up the forest or managing hedgerows, ground vegetation can be released by girdling large trees. The girdled trees live for two or three years before they die and give the lower-canopy vegetation a chance to grow. The standing dead trees provide nesting and feeding sites for wildlife.

12. Planting Shrubs and Evergreens

Shrubs should be planted in an open field to provide escape cover, food, nesting habitat and winter cover for birds and other small animals.

The recommended shrubs include multiflora rose, autumn olive, high bush cranberry and evergreens. They should be planted in clumps or well-spaced, staggered rows.

To protect desired shrubs in their early growth stages, it is necessary to reduce their competition by the mulching or chemical treatment of grass and weeds around the shrubs.

13. Den Trees

When a tree is past its productive growing years, considered as timber, it is often just beginning to be of the greatest value to wildlife. Left standing, old and dying trees remain dry and solid, providing dens or nesting cavities for wildlife for years to come.

At least one den tree should be left standing on each acre of forested land to encourage wildlife such as raccoons, squirrels and some species of ducks.

At the edges of fields, dead trees are excellent vantage points for raptors when resting or hunting.

14. Food Trees

Most food-producing trees should not be cut. Trees that produce a nut or fruit crop each year are highly desirable in a hardwood forest because they provide an important food source for wildlife at critical periods of the year—usually winter. The species that benefit most include deer, squirrels and wood ducks.

In September the work was reviewed and improvement practices were completed by mowing around woodlots and hedgerows to maintain open fields and encourage new growth.

These techniques can be applied successfully on any property where wildlife habitat improvement is the goal.

Fishing for flavor—Carp

by C. R. Jorgensen
Biologist, Lake Nipissing Fisheries Assessment Unit

CARP, *Cyprinus carpio*, resemble goldfish with which they hybridize readily. The body is robust and laterally compressed, usually olive-green on the back and yellowish on the belly. It is often covered with large scales but the scales are occasionally enlarged and scattered and they may be entirely absent. The dorsal fin has a long base.

Unlike the goldfish, the carp has two pairs of barbels about the mouth with the pair at the corners of the mouth being the most conspicuous. The mouth is medium-sized with the upper jaw slightly protruding. Although the mouth is toothless, there are teeth farther back in the pharynx which have molarlike surfaces for grinding plant tissues.

Carp usually weigh from three to seven pounds (1.4 to 3.2 kg) but in Lake Erie, the Bay of Quinte and some inland lakes they may reach weights of 30 pounds (13.6 kg) or more.

Carp were introduced to America from Europe and distributed in Canada between 1877 and 1896.

In Ontario, carp are distributed throughout the Great Lakes region from the upper St. Lawrence River to Lake Superior. They are found in many inland lakes of southern Ontario.

Carp are tolerant of eutrophication and thrive in waters unsuitable for some native species. Because carp increase the turbidity of water by uprooting and destroying submerged aquatic vegetation, they are considered detrimental not only to native fish populations but also to ducks.

In the summer, the carp may rise to the surface to feed on floating algae. At such times their large dorsal fins may be seen projecting above the water's surface.

Carp are omnivorous and will take many different baits so the angler may exercise his imagination in preparing bait. Doughballs, large kernel corn, liver paste, bread crumbs, boiled potato wrapped in mosquito netting, and worms have all been used with great success. A heavy sinker should be tied three or four inches above the hook so the bait will float a few inches off the bottom.

Fishermen looking for different techniques in taking fish should note that there is a bow-and-arrow season for carp from May 1 to June 15 in some counties of southwestern Ontario. The season extends into July in parts of eastern Ontario. Check the Ontario Summary of Fishing Regulations for all details.

With a bow of 40 to 50 pounds, wooden arrows will penetrate three feet of water and glass arrows will penetrate five feet. When the carp is beneath the water (that is, without the dorsal fin breaking the surface) allow for refraction of light and aim six inches under the spot where the carp appears to be.

Carp taken from cold water in the spring are good eating whether smoked, salted or filleted and fried in deep butter. Being a dry-meated fish, the carp is well adapted to boiling, steaming and stewing. Carp have been highly esteemed as food for centuries in Europe and Asia.

When carp have lived for a long time in muddy water, they may have a muddy flavor. This may be removed by skinning or penning in cold water. The skinning process may be started by pouring boiling vinegar over the fish. Then skin, fillet, and soak the fillets in salt from two to six hours before cooking.

THE CARP COOKERY

Stuffed Carp

3 lb. carp, cleaned and scaled
3 medium sized onions
6 cups water
1 large, carrot, sliced
2 tsp. salt
1 tbsp. sugar
2 tsp. cracked peppercorns
1 cup coarse bread crumbs
2 raw eggs, slightly beaten
pepper

Wash the dressed fish and pat dry. Cut out fins, cut off head and tail, and put into a fish kettle or stock pot large enough to take the fish when stuffed.

Skin the fish; slip the point of a sharp

Editor Laurel Whistance-Smith displays carp taken with bow and arrow.

knife under skin at neck end and peel it off, easing it along with the blunt edge of the knife and taking care not to cut through the skin. Set skin aside. Slice the flesh from the bones.

To the trimmings in the pot, add carrots and a sliced onion. Add a teaspoon of salt, peppercorns and sugar. Bring to a low boil and let simmer while preparing the fish.

Put flesh of the fish through a fine mincer along with remaining salt, 2 onions and bread crumbs. Toss to blend. Add eggs and blend to a mixture. Add pepper.

Stuff the fish skin lightly, leaving room for stuffing to swell (by about 1/3 volume). Shape it with hands to resemblance of the fish and close openings with poultry lacing pins. Place the fish in the stock, adding water if necessary to cover the fish. Cover and simmer for about an hour.

Lift the fish carefully to a platter. Let cool, then cover with a damp cloth and chill in refrigerator.

Meanwhile make an aspic of the stock; re-

duce stock by about half and strain through double cheesecloth. Cool to pouring consistency.

Pour a thin film of aspic over the chilled fish and let it set until firm. Pour another layer of aspic over the fish and refrigerate until required. To serve, cut in cross slices and serve with avocado cocktail and crusty bread.

Carp Tempura with Shoyu Tempura Sauce

Cut about 1½ pounds carp fillets into cubes. Prepare vegetables as desired: cubes of apple, carrot, eggplant, zuccini, rings or strips of green pepper, onion rings, cauliflower florets, mushroom caps, and so on. Dry fish and vegetables as much as possible by patting between towels.

3 egg yolks
1/2 cup water
1/4 cup sake or white wine
1/3 cup cornstarch
1/2 cup flour
1/4 tsp. salt

Stir egg yolks, water and wine together to mix, but don't beat. Combine cornstarch, flour and salt. Mix liquid into dry ingredients and stir lightly to mix. Heat vegetable oil to 360 degrees in tempura dish or deep fry pan. Dip cubes of fish and vegetables in batter and immediately fry in hot oil until golden brown. Drain on paper towels for a moment and serve at once. Dip in shoyu sauce, made as follows, and eat with gusto!

Shoyu Tempura Sauce

This sauce is based on Japanese soy sauce, called shoyu (pronounced *show yew*) and available from Japanese or oriental grocers (who are usually reliable consultants on the use of their products). The Chinese version can be substituted.

The shoyu is combined with sugar and clear stock called dashi, made from dried fish called katsu°, also available from a Japanese grocer, and sake (rice wine) or medium-dry white wine.

The dashi, or stock, is made by covering the katsu° (dried fish) with water and soaking it for several hours. It is brought to a simmer and simmered gently until the liquid is reduced by half, then strained.

To make the final sauce, combine:

1 cup dashi fish stock
2 tbsp. white wine or sake
1½ oz. shoyu sauce
2 tbsp. white sugar.

Serve the sauce in individual bowls for dipping.

Rich Carp Chowder

1½ cups boned carp
2 cups water
2 oz. butter
1 cup cream
¼ tsp. pepper
½ tsp. salt
1 onion, sliced
1 tsp. English mustard
½ tsp. walnut catsup

Wash the fish in warm water, place in just enough water to cover, and simmer until tender enough for the bones to be removed. Flake the fish, place in a stewpan with the other ingredients and seasonings. Stew until thick, garnish with slices of lemon, and serve.

Carp Salad

2 cups flaked cooked carp
1 cup cooked elbow macaroni
½ cup chopped sweet pickles
½ cup French dressing
¼ tsp. salt
½ tsp. horseradish

Combine all ingredients, chill an hour before serving. Gooot!

Northern lowlands mapped by satellite

The James Bay and Hudson Bay lowlands cover close to one-quarter of Ontario but relatively little is known about them. To fill the knowledge gap, the Ontario Centre for Remote Sensing, of the Ministry of Natural Resources, has begun to map the lowlands by the use of satellite photography. The result will be a series of maps which will accurately detail the surface features and the different types of vegetation. *—Moosonee District*

A million trout

Tarentorus Fish Culture Station has an annual production target of about one million trout—lake, brook, splake, and rainbow trout. It is located at the end of Fish Hatchery Road, seven miles (11 km) from Sault Ste. Marie and is open to visitors except on statutory holidays.

A change in values

by J. J. Armstrong*
Head, Technical Development Section
Ministry of Transportation and Communications

FOR the 17 years I have been a biologist, I have seen first hand the ill treatment of lands and waters.

I have seen streams run white with the whey from cheese factories, grey-black from the effluent of canning factories, light-brown from the effluent of paper companies and red, orange, green, yellow and purple from textile mills.

I have seen bulldozers where corn ought to be and corn where mallards and bull frogs ought to be. I have seen trout streams in Norfolk County filled with sand from land erosion, pond excavation and road construction; valuable maskinonge spawning habitat in the Kawarthas destroyed in the interests of cottage development; and the brown haze of air pollution over Toronto.

With the proclamation of The Environmental Assessment Act on April 20, 1976, Ontario took a major step in attempting to slow down the rate of environmental degradation. Perhaps I am an optimist, but I feel the Act has great potential for preventing or mitigating some of the environmental degradations mentioned above.

What we now call environmental degredation was often considered an unfortunate by-product of the societal needs of yesteryears—it was something to be tolerated. Since there was little knowledge about the effects or the environmental costs, nor of remedial measures, it is not surprising that few preventative steps were taken. In addition, there was little incentive or ability to take the appropriate remedial action.

Traditionally steps to prevent or mitigate environmental degradation were taken as a result of crisis situations and only when societies could afford to spend public funds on environmental programs. However, ''management by crisis'' has been shown to be a poor way to manage resources.

In the mid 1960s the present environmental movement emerged as a political force in the United States, aided by a youth generation upset by the state of world affairs. As pollution and environmental degradation were so obvious, it is not surprising that social and political protests became increasingly oriented toward environmental issues. This no doubt had some influence on the initiation of the National Environmental Policy Act, passed in 1969 by the U.S. Federal Government.

In Ontario, similar environmental issues triggered a public environmental consciousness which resulted in the passage of The Environmental Assessment Act with the approval of all three major political parties.

Until recent times, the inevitable conflicts between developmental goals and environmental goals were resolved in favor of the former. When society desires economic and material growth more than it desires an undegraded environment, the latter is lost. Society cannot have high economic and material growth while attaining the ultimate in an undegraded environment. The Act can, therefore, be viewed as a counter-balance to the forces of economic growth that have dominated the 20th century. Of greater importance, however, is that the Act has been implemented at a time when many ecosystems are under extreme stresses and some have already collapsed.

The intent of the Act is the ''betterment'' (Section 2) of the ''environment'' (Section 1(c)). The words ''betterment'' and ''environment'' are especially significant since these terms collectively imply the trade-offs between the two conflicting concepts—growth and environment—and that a combination of the two, which is in the best interests of society, is desirable. Looking still deeper for the intent of the Act, one finds in Section 5(3), which describes the contents of Environmental Assessment, the need to use a rational decision-making process. Still another intent can be found in Part II of the Act which implies the public should participate in environmental assessment.

Environmental assessment can be consid-

*The views expressed by the author do not necessarily reflect those of the Ontario Ministry of Transportation and Communication.

ered as a rational decision-making process which considers all factors and all alternatives in an open public forum. Theoretically, a proponent of an undertaking, who prepares a proper environmental assessment, should have no fear of delays and unnecessary hearings.

Because every environmental assessment can be criticized on the validity or interpretation of the technical contents, it is in the proponent's best interest to conduct a thorough study, which includes public participation. By employing the rational decision-making process that the Act requires, a proponent ensures that the most appropriate decisions will have then served both himself and the public to the fullest. In other words, better decisions, both environmentally, technically and economically, should be the result.

Five years before the Act became law, the Ministry of Transportation and Communications voluntarily established an Environmental Office to integrate environmental factors into all aspects of the Ministry's work. This is not to say that environmental factors were not considered before 1971; the difference was in the degree of integration.

This new office, working in conjunction with planning, design and construction engineers, has developed innovative approaches for the integration of environmental factors into the Ministry's decisions and involving the public at all stages of project development.

The methods developed have been progressively refined and are now routinely applied by M.T.C. at all stages of project development. The Ministry has been commended on many occasions for the way it has conducted its studies. After one route location study, a gentleman said, "You know you are going to hurt me because of the decision that you have made and I am going to fight you when you come to buy my property, but I have to admit *you made the right choice*."

The Environmental Assessment Act promotes the kind of environment, both natural and social, in which present and future members of society will want to live. It is encouraging that the occurrences of environmental degradation, which caused me such distress in the past, are already being reduced.

The values that society holds are reflections of the influences of the past, its perceptions of the present and its desires for the future. The Environmental Assessment Act is evidence of a change in the values of our society.

Head of great blue heron, showing incision made by herring gulls.

Ron Spurr nurses great blue heron.

A grateful(?) great blue

Report and photos by D. C. Smith
Visitor Services Programmer, Chatham District

WHILE making an inventory of plants on East Sister Island in the summer of 1977, my colleagues and I observed a one-sided battle between a flock of herring gulls and a great blue heron, that gangling flying creature reminiscent of the prehistoric pterodactyL

Thirty breeding pairs of great blue herons, *Ardea herodias*, occupied nests in a stand of trees on the western end of the island and they guarded their territory carefully. The eastern end of the island was the preserve of the herring gulls, *Larus argentatus*, and dozens had nests on the rocky shore.

The island is a Provincial Nature Reserve, a 60-acre limestone outcrop west of Pelee Island in the centre of the western basin of Lake Erie.

Working near the eastern shore on a hot day in July, Bill Atkinson, Ron Spurr and I noticed a mature heron flying over a feeding flock of gulls. Immediately, the gulls flew up to attack the heron and, in a series of charges, forced the big bird into the choppy waters of Lake Erie. Once in the water, the heron was helpless, and the gulls continued their attack until the great blue was washed close to the shore.

Ron Spurr, our intrepid lands planner, waded into the lake and picked up the exhausted and drowning heron. A great blue is capable of stabbing a man with its long, sharp beak, but our specimen was too tired to struggle. The gulls had opened a long cut on the top of its head and it was shivering uncontrollably.

We wrapped the heron in a beach towel and left it to rest on the rocky beach while we completed our assignment. We could see it stretching itself gradually until its entire four-foot length was erect. And then it was gone—as soon as its wings were dry. Throughout the long summer day, we wondered about the fate of our buddy.

As we were leaving the island to return to Kingsville, the imposing and graceful bulk of a great blue swooped down over our boat and emitted a resounding "Squawk." Can we be blamed for thinking it was a word of thanks from "our" heron.

A Hawk Cliff banding station with poles that support trapping nets.

Raptor banding at Hawk Cliff

Report and photos by Marshall Field
Co-ordinator, Hawk Cliff Raptor Banding Station Committee

THE raptor banding station at Hawk Cliff is one of the few banding stations in Canada designed specifically to capture raptors with spring activated trap nets (bownets). Since it was established in the fall of 1969, 16,000 raptors have been captured, banded and released, with only a slight interruption in their migration. Our equipment and techniques have improved so much that on a peak day we were able to band twice as many hawks as the 202 we banded in our first fall.

Hawk Cliff is an excellent raptor banding site because a large volume of hawks pass through the area on a relatively narrow front. Naturalists have used the area for viewing since about 1950. The first migration study at Hawk Cliff was completed in the fall of 1967 by John Haugh of Cornell University.

My inspiration to trap hawks came during a visit to the hawk lookout at Derby Hill, New York, on the southeast corner of Lake Ontario in the spring of 1969. My interest was aroused by the sight of a single sharp-shinned hawk coming in on a high-speed dive (stoop) to a lure. I immediately began to plan the Hawk Cliff Banding Station in my mind.

Two fellow members of the Ontario Bird Banding Association, Bill Wasserfall and John Roberts, and a Cornell University student, Jim Grier, joined me in getting things started in September, 1969.

We capture raptors with nets and lure birds. Lure birds are as necessary to this method of hawk trapping as live minnows are to fishermen. We use only unprotected species such as pigeons, English sparrows and starlings. The birds are afforded some protection by a body harness and are rested and rehabilitated after a day of use.

Today we operate eight stations positioned to intercept the flight pattern for 2.4 km. (1½ miles) from the cliff's edge. At each station is a small building with slits in the front and sides which can conceal three people and their banding equipment (holding tubes, weigh scales, bands).

A series of lines are attached to a bownet to allow its control from the building. A harnessed lure bird is attached to a line and when it is tightened inside the building the

A marsh hawk on its first migration.

bird rises into the air and then flutters to the ground. If the lure bird is presented properly, it will often precipitate an attack from a hawk within hunting range. Sometimes the hawk will bind onto the lure bird and be captured in the bownet. Frequently, it will veer off and become entangled in a back-up mist net, a black fine-mesh net.

Eighteen species of raptors have been banded at Hawk Cliff during the past eight years, and the sharp-shinned hawk is by far the most common. The young-of-the-year show up in early September and the adults appear near the end of the month and continue to migrate until the middle of October.

Of the buteos, the red-tailed hawk is most frequently caught. It peaks in numbers towards the end of October or early November.

The smallest and fiercest hawk to handle is the American kestrel (sparrow hawk). It is notorious for drawing blood with a quick pinch from a hooked beak or a grasp with needle-like talons.

Some of the rare raptors we have caught include one Swainson's hawk, two golden eagles, and one gyrfalcon. The uncommon group has included the broad-winged hawk, red-shouldered hawk, rough-legged hawk, peregrine falcon, and merlin (pigeon hawk). Because of the nature of their food supply and feeding habits the trapping of bald eagles and ospreys poses special problems and is undertaken elsewhere in special research projects.

Foreign recoveries (birds retrapped after banding in some other locale) are interesting. Several of our birds have been retrapped at or near Point Pelee which indicates an average day's migration of about 160 km

(100 miles). One of our sharpshins was retrapped at Duluth, Minnesota, which indicates they do not always use the same flyway. Another sharpshin was retrapped in Texas one month after it was banded at Hawk Cliff.

Several recoveries during the nesting period indicate that most of our Hawk Cliff migrants are coming from northeastern Ontario and the western portion of Quebec. Two young red-tailed hawks, banded as nestlings in Michigan, were retrapped the autumn of the same year at Hawk Cliff, indicating that they wander considerably before their true migration commences.

On September 17, 1977, we captured a banded peregrine falcon that was raised at Wainwright, Alberta, and later released at Hull, Quebec, in a reintroduction program undertaken by the Canadian Wildlife Service. This western-hatched bird was right on course, travelling on an eastern flyway.

We share our banding experience with the public at the Hawk Cliff viewing weekend, usually the third weekend in September. We provide banded hawks for interpretive sessions which are given twice daily. This seems to be a highlight for many people, some of whom have never seen a hawk at close range. They have the opportunity to photograph hawks and witness their release. On one particular day we were able to present a merlin, a kestrel and a peregrine, three of the four falcon species found in the east.

We are pleased that our station has been used by the MacDonald College Raptor Research Centre and the University of Guelph. Our sightings are published by the Hawk Migration Association of North America, and our annual banding report is published by the Ontario Bird Banding Association.

Hawk banding in Ontario is regulated by both the federal and provincial governments. The banding permit is issued by the Canadian Wildlife Service. The Ministry of Natural Resources controls the handling of raptors and endangered species, and the holding of any casualties for scientific purposes. One bander has a permit to rehabilitate injured raptors.

Banders enjoy observing and handling a wide variety of raptors. But what scientific benefits are derived from banding hawks? Age ratios indicate hatching success; recovery data provide information on breeding range and wintering areas; and lifespans of raptors can be estimated.

The 25 members of the Hawk Cliff Raptor Banding Station Committee share a sense of pride in the development of the banding station over the past eight seasons. Thousands of hours have been given selflessly towards hawk banding to gather information and increase our knowledge of birds of prey.

A peregrine falcon, newly banded. —Photo by Alex Foster

Right—A sharp-shinned hawk, caught in mist net.